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10/070,355	03/06/2002	Paul Kleinberger	02/23506	2866

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EXAMINER

FINEMAN, LEE A

ART UNIT	PAPER NUMBER
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2872

DATE MAILED: 11/24/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/070,355

Applicant(s)

KLEINBERGER ET AL.

Examiner

Lee Fineman

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 16 September 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-68 is/are pending in the application.
- 4a) Of the above claim(s) 1-15, 17-23, 29, 34, 35 and 38-55 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 16, 25-28, 30-33, 36, 37 and 56-68 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 3/6/02 & 9/16/04 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

This Office Action is in response to an amendment filed 16 September 2004 in which claims 16, 25, 32, 33, 37, 56, 58 and 63 were amended and claims 64-68 were added. Claims 1-68 are pending, of which claims 1-15, 17-23, 29, 34-35 and 38-55 are withdrawn.

Drawings

1. Replacement drawings were received on 16 September 2004. These drawings are acceptable.

Claim Objections

2. Claims 25-28 and 30-31 are objected to because of the following informalities: In claim 25, the limitation "said first optical layer" lacks antecedent basis. The dependent claims inherit the deficiencies of the claims from which they depend. Appropriate correction is required.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claim 37 is rejected under 35 U.S.C. 102(b) as being anticipated by Rehorn, U.S. Patent No. 2,883,906.

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Rehorn discloses in fig. 5 a system for stereoscopic or autostereoscopic viewing, the system designed and controlled to present a combined image (see fig. 1) of left (L, 33) and right (R, 32) image picture elements of left and right images (3, 3'), the system comprising a display (18) wherein each pixel is operable simultaneously to present a left image picture element in a first polarization orientation and a right image picture element in a second polarization orientation different from said first polarization orientation (see fig. 1).

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 16, 25-28, 31-33, 36 and 56-65 are rejected under 35 U.S.C. 103(a) as being unpatentable over Rehorn in view of Kleinberger et al., U.S. Patent No. 5,822,117.

Regarding claims 59-62, Rehorn further discloses a display (18) for displaying a uniformly polarized combined image of left and right image picture elements of left and right images (see fig. 1); a birefringent layer (5) being positioned in front of said display (fig. 5) and serving for re-dividing said uniformly polarized combined image by controlled partial light rotation (column 4, lines 10-16), thereby constructing an image having superimposed left and right image picture elements of left and right images, respectively, in which superimposed light of said left image is polarized differently from superimposed light of said right image (column 3, line 20-column 4, line 16); light of said left image displayed in adjacent picture elements is

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polarized differently and light of said right image displayed in adjacent picture elements is polarized differently (see fig.2-A); operable to present an image wherein light of said left image is polarized uniformly and the light of said right image is polarized uniformly (column 3, line 20-column 4, line 16). Rehorn discloses the claimed invention except for the birefringent layer having individually switchable elements and wherein said individually switchable elements are each optically aligned with a respective pixel of said display, and wherein each of said individually switchable elements is controlled to vary the polarization of output light from a display pixel with which it is optically aligned.. Kleinberger et al. teaches an autostereoscopic system in fig. 18 with a birefringent layer (111 or 112) with individually switchable elements and wherein said individually switchable elements are each optically aligned with a respective pixel (subarea) of said display, and wherein each of said individually switchable elements is controlled to vary the polarization of output light from a display pixel with which it is optically aligned (fig. 18). It would have been obvious to one of ordinary skill in the art at the time the invention was made to replace the birefringent layer of Rehorn with the birefringent layer with individually switchable elements of Kleinberger et al. to provide more control and flexibility of the size and shape of the alternating birefringent areas.

Regarding claims 32-33, 36, 56-58 and 63-65, Rehorn discloses a system for autostereoscopic viewing (fig. 5) comprising (a) a first optical construction which comprises (i) a display (18) for displaying a uniformly polarized combined image of left and right image picture elements of left and right images (see fig. 1) wherein light intensity of each picture element of said combined image is a function of left-image light intensity at a corresponding position of a left image (3') and a right-image intensity at a corresponding position of a right image (3); (ii) a

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birefringent layer (5) being positioned in front of said display (fig. 5) and serving for re-dividing said uniformly polarized combined image by controlled partial light rotation, thereby constructing an image having simultaneously superimposed left and right image picture elements of left and right images, respectively (column 4, lines 10-16), in which superimposed light of said left image is polarized differently from superimposed light of said right image, light of said left image displayed in adjacent picture elements is polarized differently and light of said right image displayed in adjacent picture elements is polarized differently (see fig. 2-A); (b) a second optical construction (6), which is a birefringent layer, designed and constructed to be positioned between said first optical construction and a viewer and closer to said first optical construction than the viewer (fig. 5), said second optical construction when so positioned enabling a left eye (1) of the viewer to see left imagery data presented by said first optical construction (5) and a right eye (2) of the viewer to see right imagery data presented by said first optical construction (5) while substantially prevent each of the right and left eyes of the viewer from seeing light from an inappropriate image (see fig. 4) and wherein the second optical construction comprises a plurality of polarizing strips, each strip having a polarization orientation orthogonal to that of the strips to which it is adjacent (see fig. 2-A); and wherein said display includes a rear and remote light source (12 and 13) producing homogenous light rays. Rehorn discloses the claimed invention except for the birefringent layers having individually switchable elements and a uniform polarizer and wherein said individually switchable elements are each optically aligned with a respective pixel of said display, and wherein each of said individually switchable elements is controlled to vary the polarization of output light from a display pixel with which it is optically aligned. Kleinberger et al. teaches an autostereoscopic system in fig. 18 with a birefringent layer

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(111 or 112) with individually switchable elements and a uniform polarizer (110 or 113) and wherein said individually switchable elements are each optically aligned with a respective pixel (subarea) of said display, and wherein each of said individually switchable elements is controlled to vary the polarization of output light from a display pixel with which it is optically aligned (fig. 18). It would have been obvious to one of ordinary skill in the art at the time the invention was made to replace the birefringent layers of Rehorn with the birefringent layers with individually switchable elements and a uniform polarizer of Kleinberger et al. to provide more control and flexibility of the size and shape of the alternating birefringent areas.

Regarding claims 16 and 64-65, Rehorn discloses a system for autostereoscopic viewing (fig. 5) comprising (a) a first optical construction (18 and 5) operable to present superimposed left (33) and right (32) image picture elements of left and right images, respectively, said first optical construction being designed so as to polarize superimposed light of said left image differently than superimposed light of said right image (see fig. 1) and further so as to differently polarize light of said left image being displayed in adjacent picture elements (fig. 1) and differently polarize light of said right image being displayed in adjacent picture elements (fig. 1); and a configurable second optical construction (6) designed/configured and constructed to be positioned between said first optical construction (18) and a viewer (1, 2) and closer to said first optical construction than said viewer (fig. 5). Rehorn discloses the claimed invention except for (c) an eye-tracking sensor for providing information pertaining to positions of the left and the right eyes of the viewer; and (d) a control element operable to receive said eye-position information from said eye-tracking sensor, to calculate appropriate configurations of said second optical construction based on said received eye-position information, and to issue successive

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configuration commands to said second optical construction, thereby commanding configurations of said second optical construction, which configurations enable a left eye of the viewer to continuously see left imagery data presented by said first optical construction and a right eye of the viewer to continuously see right imagery data presented by said first optical construction, and substantially prevent said left eye from seeing right imagery data and substantially prevent said right eye from seeing left imagery data, while the viewer changes position with respect to said first and second optical constructions; wherein said control element is further operable to communicate with said first optical construct; wherein said control element is operable to command size and position of picture elements presented by said first optical construct. Kleinberger et al. further teaches in fig. 23 a system with (c) an eye-tracking sensor (180) for providing information pertaining to positions of the left and the right eyes of the viewer (column 38, lines 34-46); and (d) a control element operable (182) to receive said eye-position information from said eye-tracking sensor, to calculate appropriate configurations of said second optical construction (part of 183) based on said received eye-position information, and to issue successive configuration commands to said second optical construction, thereby commanding configurations of said second optical construction, which configurations enable a left eye of the viewer to continuously see left imagery data presented by said first optical construction and a right eye of the viewer to continuously see right imagery data presented by said first optical construction, and substantially prevent said left eye from seeing right imagery data and substantially prevent said right eye from seeing left imagery data, while the viewer changes position with respect to said first and second optical constructions (column 38, lines 9-19 and column 39, lines 17-35); wherein said control element is further operable to communicate with

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said first optical construct (also part of 183); and wherein said control element is operable to command size and position of picture elements presented by said first optical construct (column 38, lines 15-19). It would have been obvious to one of ordinary skill in the art at the time the invention was made to add the eye-tracking sensor and control element to the system of Rehorn in view of Kleinberger et al. to provide a more adaptable system in which the viewer is allowed movement while still providing a stereoscopic match.

Regarding claim 25-28 and 31, Rehorn discloses a system for providing autostereoscopic viewing to a viewer (fig. 5) comprising (a) a pixilated display (18) for displaying a uniformly polarized combined image (see fig. 1) of left (31 or 32) and right (the other of 31 or 32) picture elements of left and right images (3' and 3); (b) a first birefringence layer (5) having elements positioned in front of said display (fig. 5) and serving for re-dividing said uniformly polarized combined image by controlled partial light rotation (see fig. 2-A); (c) a second birefringent layer (6) positioned between said viewer and said first birefringent layer (fig. 5); and wherein said display includes a rear and remote light source (12 and 13) producing homogenous light rays. Rehorn discloses the claimed invention except for the birefringent layers having individually switchable elements and a uniform polarizer; an eye-tracking module; and a controller operable to control switchable elements of said first and second birefringent layers based on information received from said eye-tracking module, the system being operable to provide autostereoscopic viewing to a moving viewer, each of said viewer's right and left eyes seeing, simultaneously, and appropriate image, at full pixel resolution of said display; and wherein the birefringent layer with individually switchable elements wherein said controlled partial light rotation is effected by controlled degree of light rotation, controlled time periods of light rotation or both. Kleinberger

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et al. teaches an autostereoscopic system in fig. 18 with a birefringent layer (111 or 112) with individually switchable elements and a uniform polarizer (110 or 113) and wherein said individually switchable elements are each optically aligned with a respective pixel (subarea) of said display, and wherein each of said individually switchable elements is controlled to vary the polarization of output light from a display pixel with which it is optically aligned (fig. 18); and wherein the birefringent layer with individually switchable elements wherein said controlled partial light rotation is effected by controlled degree of light rotation, controlled time periods of light rotation or both (column 34, lines 46-64). It would have been obvious to one of ordinary skill in the art at the time the invention was made to replace the birefringent layers of Rehorn with the birefringent layers with individually switchable elements and a uniform polarizer of Kleinberger et al. to provide more control and flexibility of the size and shape of the alternating birefringent areas. Kleinberger et al. further teaches in fig. 23 a system with (c) an eye-tracking module (179); and a controller (182) operable to control switchable elements of said first and second birefringent layers based on information received from said eye-tracking module, the system being operable to provide autostereoscopic viewing to a moving viewer, each of said viewer's right and left eyes seeing, simultaneously, and appropriate image, at full pixel resolution of said display (column 38, lines 9-19 and column 39, lines 17-35). It would have been obvious to one of ordinary skill in the art at the time the invention was made to add the eye-tracking sensor and control element to the system of Rehorn in view of Kleinberger et al. to provide a more adaptable system in which the viewer is allowed more movement while still providing a stereoscopic match.

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7. Claim 30 is rejected under 35 U.S.C. 103(a) as being unpatentable over Rehorn in view of Kleinberger et al., as applied to claim 25 above, and further in view of Omar et al., U.S. Patent No. 6,449,090 B1.

Rehorn in view of Kleinberger et al., as applied to claim 25 above discloses the claimed invention except for further comprising a lens element for focusing light from said display onto said birefringent layer. Focusing lenses are well known in the art for providing light to a display and for focusing light respectively. For example, Omar et al. teach in fig. 5 a lens element (4 or 5) for focusing light. It would have been obvious to one of ordinary skill in the art at the time the invention was made to use a well known lens element in the system for better focus/control of the light from the display to the birefringent layer.

8. Claims 66-68 are rejected under 35 U.S.C. 103(a) as being unpatentable over Rehorn in view of Kleinberger et al., as applied to claim 65 above, and further in view of Morishima et al., U.S. Patent No. 5,875,055

Rehorn in view of Kleinberger et al., as applied to claim 65 above further comprises a light source (12 and 13, Rehorn) and wherein a first uniformly polarizing layer (110 from Kleinberger with birefringent layer 111 or 112) is positioned between said light source and said birefringent layer/optical construction and a second uniformly polarizing (110 from Kleinberger with other birefringent layer) positioned between said light source and said second birefringent layer/optical construction. Rehorn in view of Kleinberger et al., as applied to claim 65 above discloses the claimed invention except for explicitly stating that wherein the birefringent layers are a first pixilated liquid crystal panel and a second pixilated liquid crystal panel. Morishima et

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al. teaches in fig. 5 pixilated liquid crystal panels being used as birefringent layers with individual switchable elements. It would have been obvious to one of ordinary skill in the art at the time the invention was made to make the birefringent layers with individual switchable elements of Rehorn in view of Kleinberger et al. pixilated liquid crystal panels as suggested by Morishima et al. to provide high resolution stereoscopic effects free from flicker (column 1, lines 63-65, Morishima)

Response to Arguments

9. Applicant's arguments with respect to claims 16, 25-28, 30-33, 36-37 and 56-68 have been considered but are moot in view of the new ground(s) of rejection.

10. It is noted by the Examiner that the drawing and specification objections and the 112 rejection made in the previous Office Action have been withdrawn due to amendment by the Applicant.

Conclusion

11. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after

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the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Lee Fineman whose telephone number is (571) 272-2313. The examiner can normally be reached on Monday - Friday 7:30 - 4:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Drew Dunn can be reached on (571) 272-2312. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



LAF

November 22, 2004


MARK A. ROBINSON
PRIMARY EXAMINER